

prepASH 2xx

Service manual

1	Introduction	4
1.1	General information about the service manual	4
2	Safety instructions	4
2.1	General safety instructions	4
2.2	Symbols	5
3	Tool kit/material	5
4	Instrument overview	6
5	Open prepASH	8
6	Maintenance	8
6.1	cleaning of the housing and the sample chamber	8
6.2	cleaning of ventilation	9
6.2.1	Tools	9
6.2.2	Remove upper cover	9
6.2.3	Cleaning the airing	10
6.2.4	Reinstall the upper cover	10
6.3	Filter mat: cleaning/replacing	10
6.4	Lubricate recirculating ball screws and linear guidings	11
6.4.1	Stroke	11
6.4.2	carriage (only prepASH229)	12
7	Calibrations / Configurations	12
7.1	INFO	13
7.2	PrepASH ID	13
7.3	prepASH Type	13
7.4	Disk	13
7.5	User account	14
7.6	Gas adjustment	14
7.7	Balance calibration	15
7.8	Mechanical calibration	15
7.9	Temperature calibration and adjustment	16
7.9.1	Temperature calibration	16
7.9.2	Temperature adjustment	17
7.10	Calibration of the overheat protection temperature sensor	18
7.11	Erase file	19
7.12	Quit	20
8	Error messages	21
8.1	Error 1: Interface board-Reset	21
8.2	Error 2: Communication-error between Touch panel and Interface board	21
8.3	Error 3: Balance error	21
8.4	Error 4: Communication-error between Touch panel and Temperature-Module (7018)	21
8.5	Error 5: Communication-error between Touch panel and Flow-Module(7017)	21
9	PrepASH Software	22
9.1	PrepASH software update	22
9.2	Installing a printer on prepASH	22
10	Process gas flow unit	22
11	Terminal	23
11.1	Exchange flash card	23
11.2	Exchange terminal	24
12	Heating	24
12.1	Diagnosis	24
12.2	Remove upper cover	24
12.2.1	Tools	24

12.2.2	Remove upper cover	25
12.3	Change heating coil (340-8007)	27
12.3.1	Remove upper cover completely	27
12.3.2	Remove hood (hotplate)	28
12.3.3	Uncover isolation/heating coil	29
12.3.4	Install isolation/heating coil	29
12.3.5	Assemble hood (hotplate)	29
12.3.6	Assemble upper cover	29
13	Exchange isolations/quartz disk	30
13.1	Upper isolation (drawing 340-8007)	30
13.1.1	Remove upper cover completely	30
13.1.2	Remove hood (hotplate)	31
13.1.3	Isolation	32
13.1.4	Assemble the isolation/quartz disk	32
13.1.5	Assemble hood (hotplate)	32
13.1.6	Assemble upper cover	32
13.2	Exchange lower isolation	33
13.2.1	remove upper cover	33
13.2.2	Remove hood (hotplate)	33
13.2.3	Uncover and remove the lower isolations (340-6400)	33
13.2.4	Assemble the isolations	34
13.2.5	Assemble the hood (hotplate)	34
13.2.6	Assemble upper cover	35
14	Exchange the stack	36
14.1.1	Disassembling	36
14.1.2	Installation	36
15	Exchange the lance	37
16	Replace the thermometer	37
17	Exchange the drive unit	38
17.1.1	Disassembling	38
17.1.2	Installation	39
18	Adjust pneumatic	39

1 Introduction

1.1 General information about the service manual

This service manual is valid for the drying and ashing system prepASH xxx

The manufacture exclude liability for damages which result from

- inadequate maintenance,
- nonconforming location,
- wrong or non competent installation of the instrument,
- modification without authority or neglecting recommendations,
- using accessories/spare parts other when recommended or delivered by manufacture.

This service manual contains fundamental instructions to be followed before doing any service or reparation step. This service manual, has to be read and understood by everybody doing any of the following work.

2 Safety instructions

2.1 General safety instructions

- **Environmental conditions**
- Temperature: 5 °C – 35 °C
- Relative humidity: 25 % -85 %, non condensing, not corrosive
- **Location and ventilation**
- Only set prepASH up in a room which is adequately spacious, dry and well ventilated.
- Only operate the device upright on its stand and on a stable, level base.
- Observe the following safe distances from neighbouring devices, equipment and walls: space of at least 15 cm around the sides and at least 1.5 m from the ceiling
- The exhaust gas hose must be fed into an exhaust system.
- **Power cord and power supply**
- Never touch any parts under voltage! This may lead to an electric shock, which may lead to serious injury or even death.
- The instrument may only be operated using the original power cord supplied (with a protective earth conductor).
- Never run the instrument with a damaged power cord.
- Voltage and frequency must be in accordance to the type label.
- **Safety-conscious work**
- Follow all safety instructions in the manual, all rules for accident prevention and all rules of technique.
- Follow the local safety rules.
- Fundamental rules of work with chemicals have to be followed. (e.g. safety glasses, protective gloves etc.)
- **Exhaust gases**
- The exhaust gas hose must be fed into an exhaust system.

Maintenance and Service

- Disconnect the prepASH from the mains during all maintenance work (pull out the plug) and ensure that the device cannot be switched on inadvertently. (Adjustment work under voltage must only be done by a specialist who is aware of that danger)
- prepASH has to be cooled down before maintenance work

- Fuse

- Under no circumstances should you use other fuses or attempt to bridge the fuse:
 - Automatic circuit breaker:
 - To be operated from the back
 - Power board:
 - 2 x 4 A slow-blow fuse

2.2 Symbols



Danger: voltage



Caution: hot surface

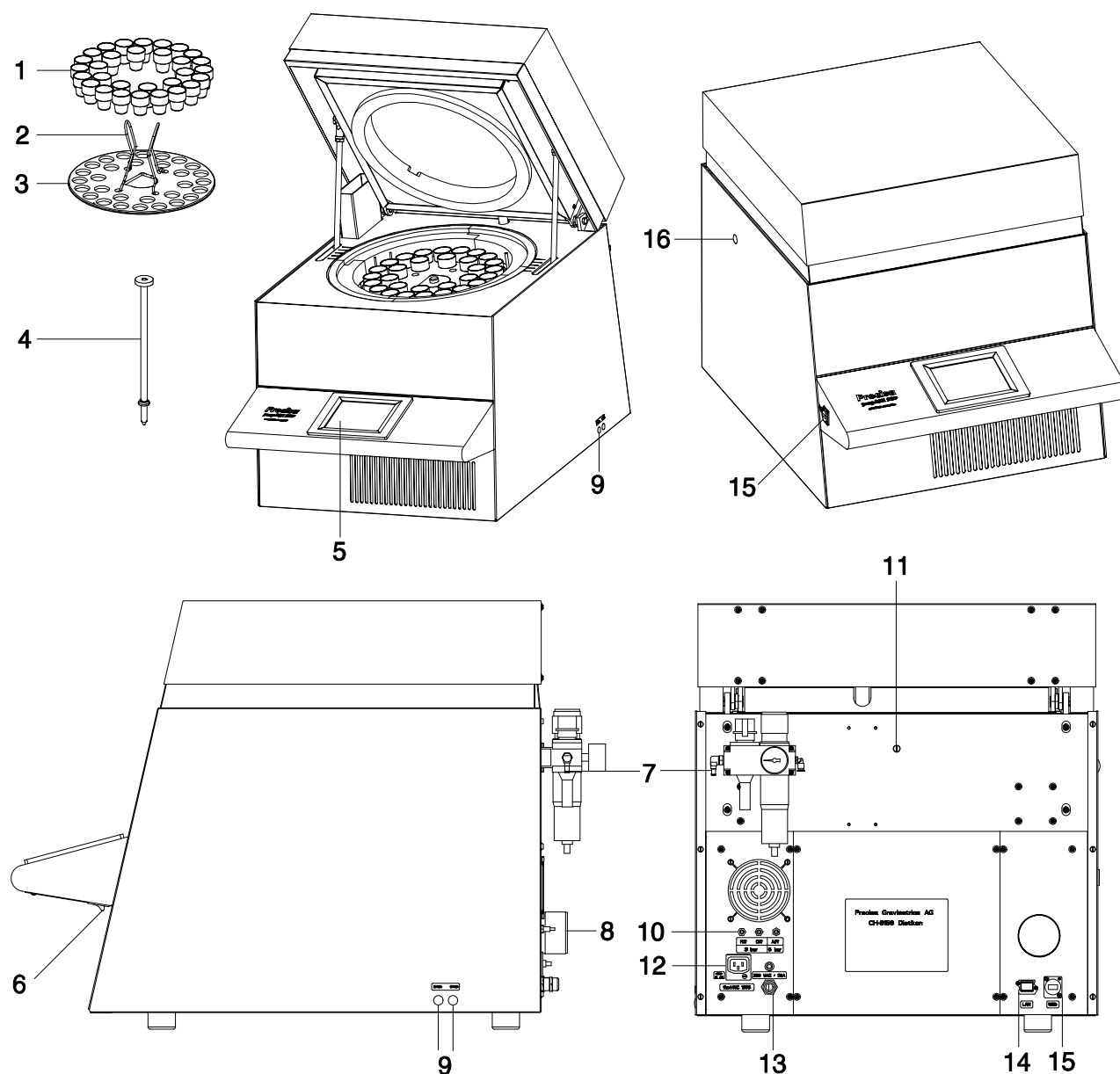


Tips and important rules

3 Tool kit/material

- Allen key 3 mm, 5 mm
- Socket wrench No 7
- Phillips screwdriver
- Slotted screwdriver No 0, No 5 short!
- Line head
- Flat wrench No 7, No 12, No 13, No 17
- Brush (290-7037)
- Lubricant (PN3950-097): Universal High Performance Molykote® BR 2 PLUS
- For temperature calibration, adjustment:
Thermometer up to 1000°C +/-5°C with sensor thermocouple Ø ≤ 3.2mm and length ≥ 16cm

4 Instrument overview

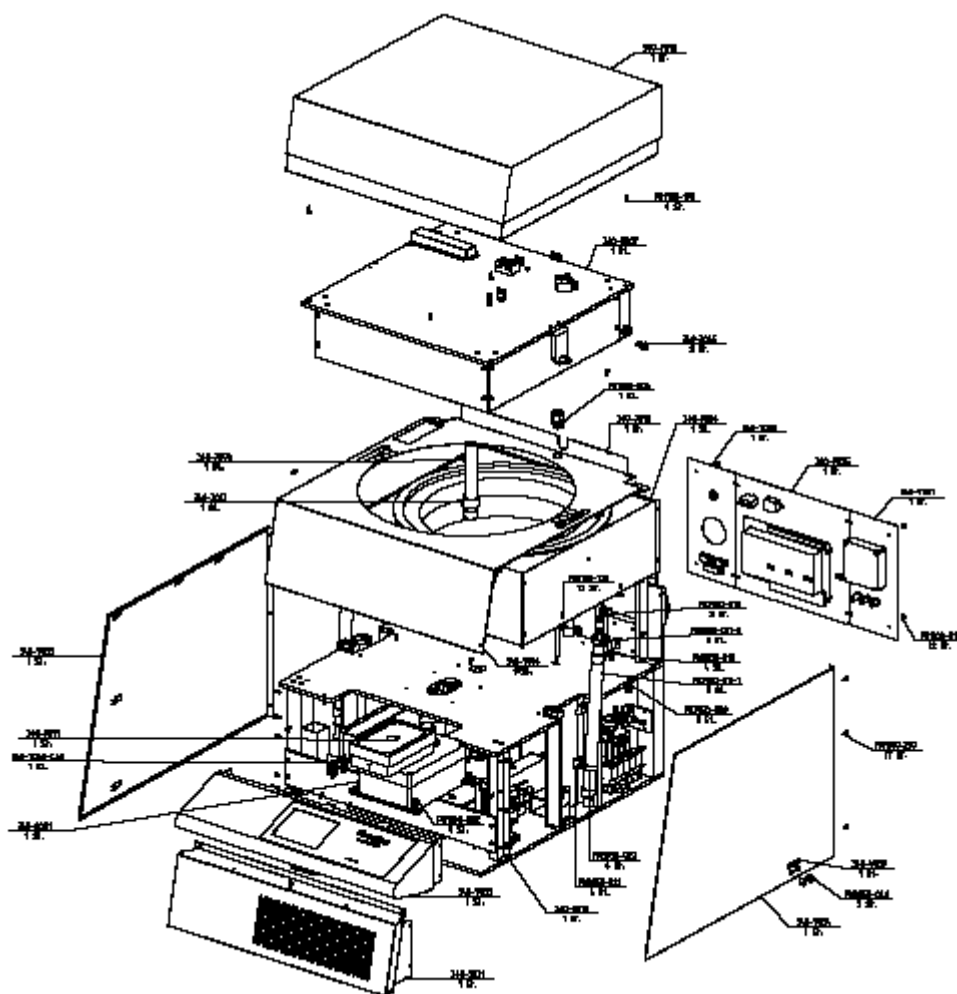


No. Description

- 1 Crucible
- 2 Plate holder
- 3 Turn table
- 4 Balance pan
- 5 Touch screen
- 6 Master switch
- 7 Maintenance unit with a compressed air connection
- 8 Exhaust gas nozzle

No. Description

- 9 Process gas flow control
- 10 Process gas and compressed air connections
- 11 Inlet for external temperature sensor
- 12 Electrical power outlet for connection of a scrubber or pump
- 13 Mains connection cable with connector CEE type 5pole male
- 14 LAN port
- 15 USB port
- 16 Mechanical connection for scrubber

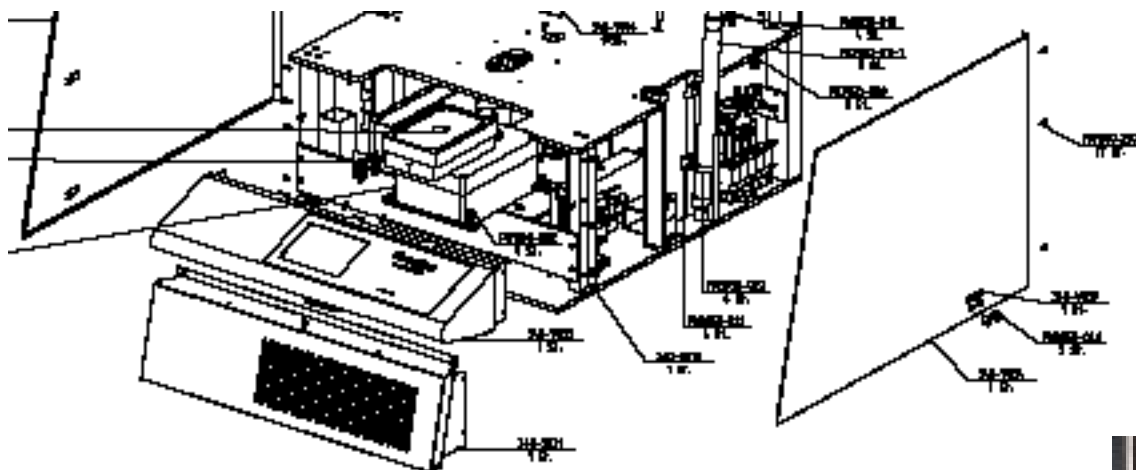


The oven can be heated up to 1000 °C
prepASH has to be cooled down before doing any step of service or repairs

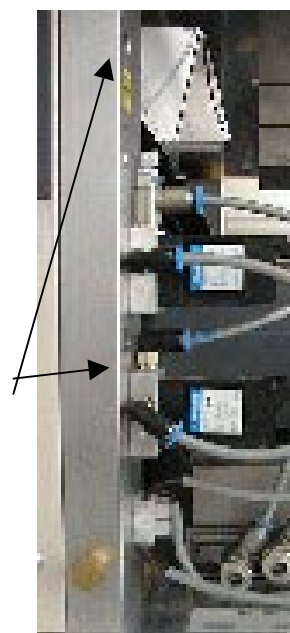


Danger: Disconnect the ashing device from the mains during all maintenance work (pull out the plug) and ensure that the device cannot be switched on inadvertently.

5 Open prepASH



1.  **Important:** Disconnect the prepASH from the mains (pull off mains plug)
2. side walls:
remove the 2 valve cover on the right hand site (340-6400/34)
remove the 3 screws on each side wall
pull the side wall around 1 cm from the device and pull it to the back
3. remove the 2 screws from the support on the front right hand site and swing the front panel out to the left



6 Maintenance

- The following steps have to be done on every service:
- open the instrument
- vacuum
- drive unit:
- lubricate the recirculating ball screws
- lubricate the linear guidings
- clean the airing (340-2004)
- control the filter mat
- if needed clean or replace it

6.1 cleaning of the housing and the sample chamber

- The housing can be cleaned on the outside with a damp cloth.
- Clean the sample chamber with a vacuum cleaner after taking out the parts inside (sample plate, crucible, balance pan). Take care of the sensitive insulating and heating radiators. Avoid damage with the suction tube.

6.2 cleaning of ventilation

! NOTE

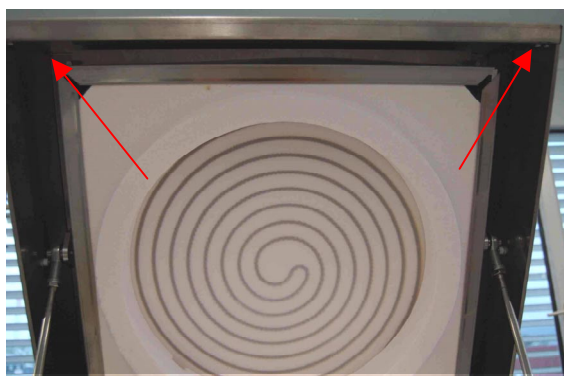
The airing has to be cleaned every 6 months to insure sufficient airing of the furnace chamber.

6.2.1 Tools

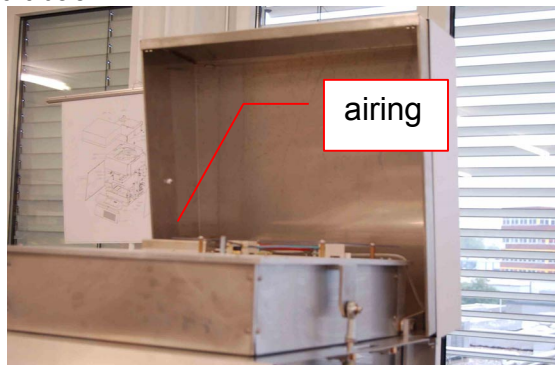
Pin type socket wrench (width across flats 7 mm)
Phillips screwdriver

6.2.2 Remove upper cover

1. Open the hood from the touch screen software 
2. Unscrew the 2 hexagon bolts in the corners of the cover from below



3. Close the cover from the touch screen 
4.  Important: disconnect the prepASH from the mains.
5. Pull the upper cover slightly forwards and tilt it back.



6. The airing is accessible.

6.2.3 Cleaning the airing

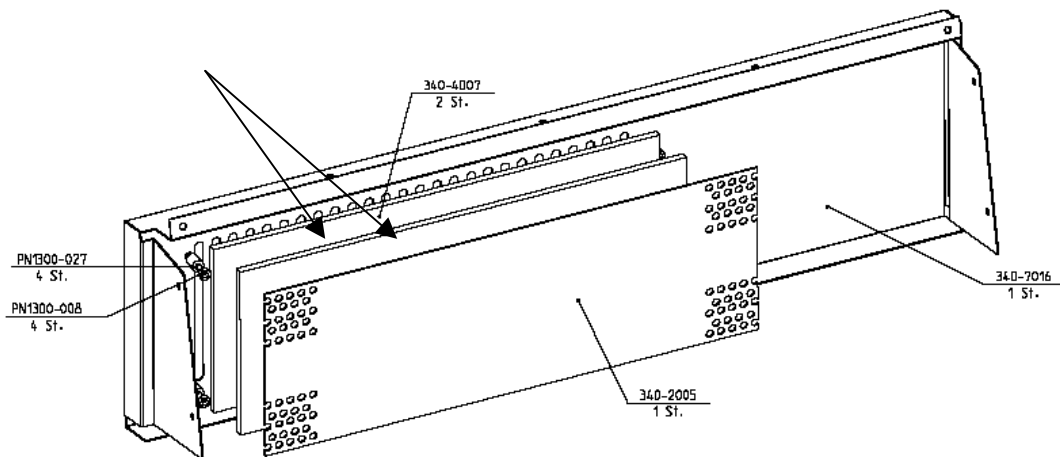
1. Unscrew the airing and clean it mechanically.
2. If needed also clean the prepASH side.
3. The ceramic tube may be cleaned mechanically



6.2.4 Reinstall the upper cover

4. Tilt the upper cover down on to the hood.
5.  Plug in the mains cable and turn on the instrument
6. Open the hood from the software.
7. Fix the upper cover on to the hood (hexagon bolts)
8. The device is now ready for use.

6.3 Filter mat: cleaning/replacing

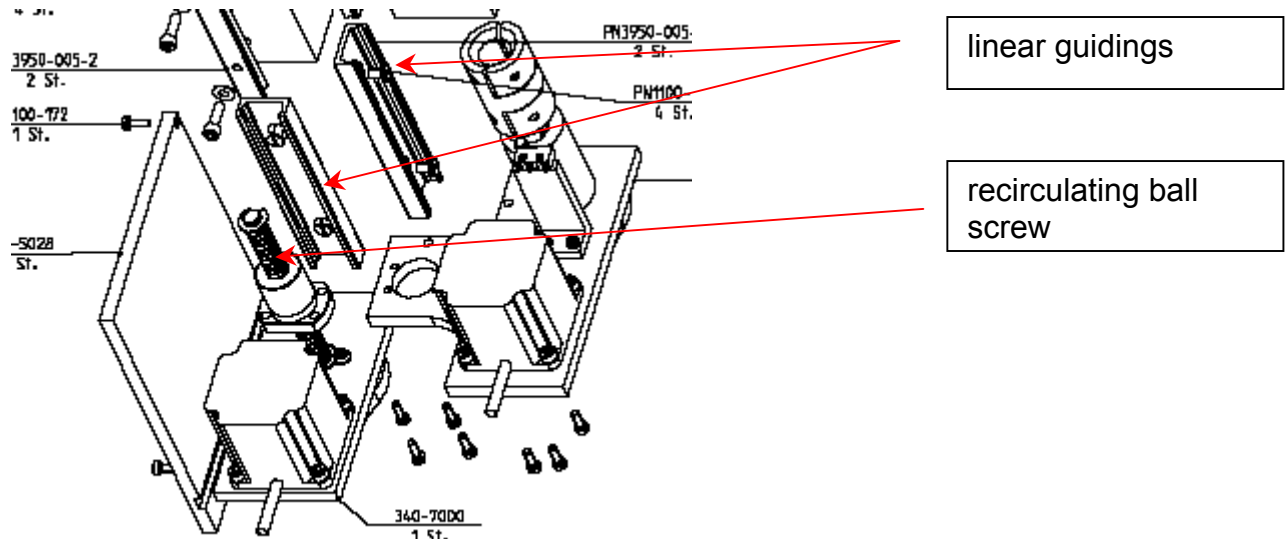


1.  Important: disconnect the prepASH from the mains (Pull out mains plug)
2. open prepASH (side walls and front panel)
3. Loosen perforated plate remove the 2 screws on the top, loosen the 2 lower screws
4. remove the mat
5. clean or replace the map
6. put the mat from the top under the perforated plate
7. close the device

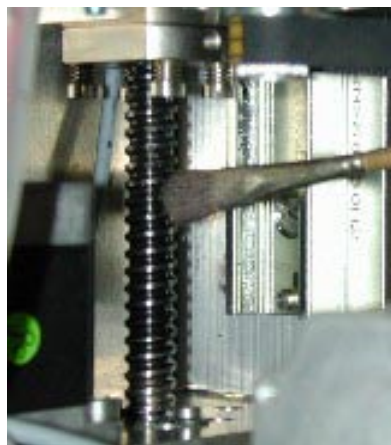
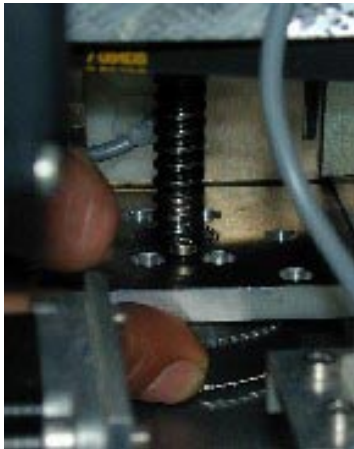
6.4 Lubricate recirculating ball screws and linear guidings

1.  **Important:** disconnect the prepASH from the mains (Pull out mains plug)
2. open prepASH (side walls and middle back)

6.4.1 Stroke



3. Turn the stroke drive manually right to the top (cogwheel resp. driven belt)

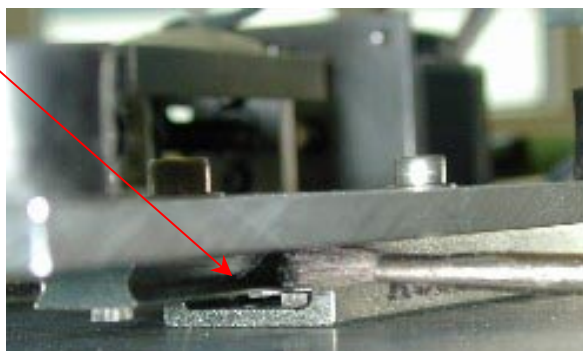
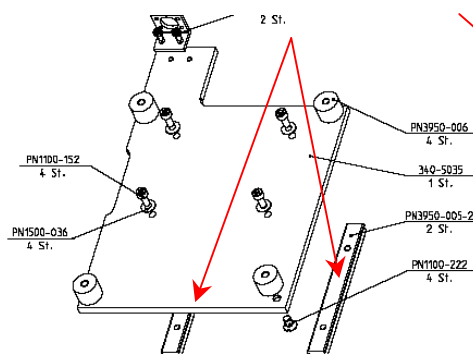


4. lubricate the upper part recirculating ball screw of the with the help of a brush
5. lubricate the two linear guidings



6.4.2 carriage (only prepASH229)

6. Lubricate the 2 linear guidings



7. Lubricate recirculating ball screw

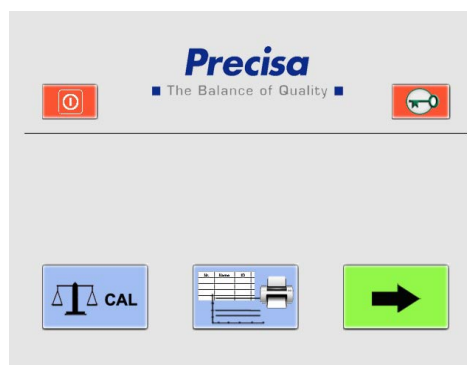


7 Calibrations / Configurations

From the user interface of prepASH software you can go directly to the service mode. Only Supervisor have access to the service mode.



Supervisor



User



Enter into the calibration and configuration part from the user interface. Click on the register needed. (The balance calibration is accessible directly for the user interface for the user too. All other calibrations are reserved to supervisor and service).

7.1 INFO

In this register you will find all information on identification and state of calibration of the system and software.

You do have the possibility to print out this

information by pressing the button



7.2 PrepASH ID

You have the possibility to add identifications to your prepASH (e.g. inventory number, number of test equipment, division).

This information will be shown on the reports of the analysis.

7.3 prepASH Type

**Access for Service Engineer only.
Password protected!**

7.4 Disk

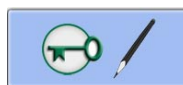
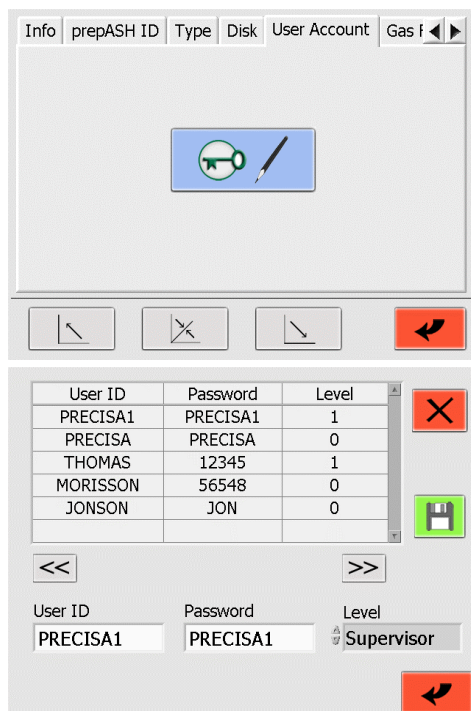
For the models prepASH229 and prepASH219 you can switch between the sample disks „19/29 Samples“ and „12 Samples“.

Exchange of the disc:

1. Choose disk in the Pull-Down Menu
2. Save your entry by pressing 
3. Exchange the turn table.

7.5 User account

Generate new „user“ and „supervisor“ in the register „User Account“.



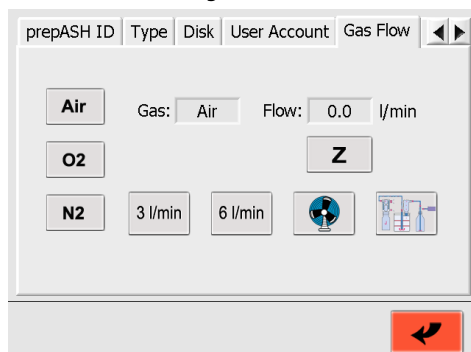
Press to enter the User Account mode

To create / change an “User Account” give an user ID, Password und Access Level (Supervisor or User)

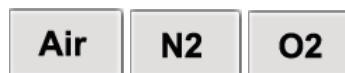
To change from one “User Account” to another or to confirm an entry, press << or >>.

Save your entries

7.6 Gas adjustment



Choose the gas and press corresponding button



Open the valve (3, 6 or 3+6 l/min).

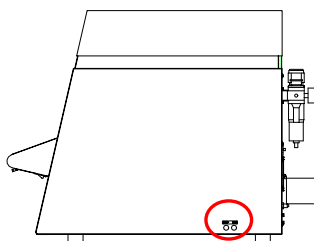
The effectively measured gas flow is indicated on the right in l/min.

(Inlet pressure: Air 6 bar, O2 und N2: 3 bar)



Press the „zero“ button if the flow is not 0.0 l/min at closed valves.

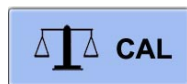
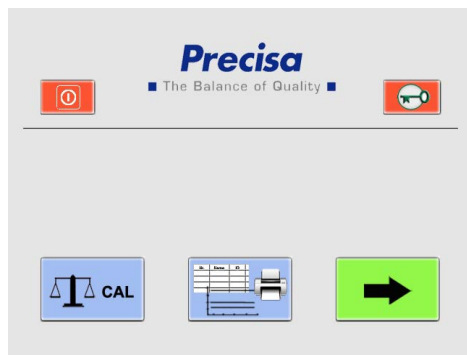
If necessary, regulate the flow of the valve (right hand side of the prepASH). Increase the flow by turning anti-clockwise.



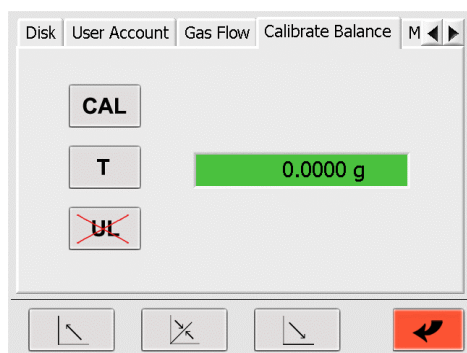
Testing the exhaust fan by pressing the Fan-button to switch on or switch off the exhaust fan.

Testing the external outlet for a Pump by pressing the Pump-button to switch on or switch off the Pump connected to the external outlet, see also chapter 4, position 13.

7.7 Balance calibration



The calibration of the balance can be activated directly from the user interface that is accessible for the Supervisor and user by pressing the calibration button.



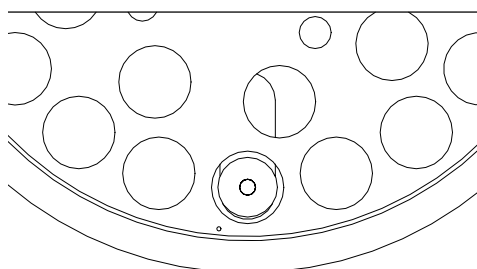
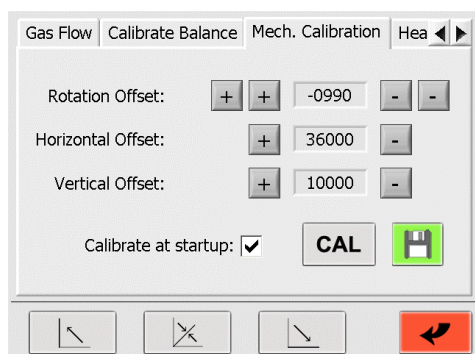
Calibration

1. Tare the balance by pressing the T button.
2. Start calibration by touching the CAL button
 - The device performs a zero point measurement. (--- 0 g ---) flashes.
 - After the zero point measurement the display flashes the calibration weight* (--- 50 g---)
 - Place the calibration weight on the pan.
 - The display flashes

Once the display stops flashing, this indicates that the calibration has ended. The value of the calibration weight is displayed.

* With the help of Intelligent Calibration Mode (ICM), the device can detect the size of the calibration weight, which makes it possible to perform a calibration with different sized weights (in 10-gram increments).

7.8 Mechanical calibration



NOTE

The small hole in the sample plate must lie to the left of the balance pan (refer to figure on the right)

CAUTION

Make sure that the motor positions are in the start position and that the sample plate is installed correctly (the easiest way is to restart the device).

Adjust the start position with „+“ and „-“. For that rotation the outer buttons are provided for a fast rough adjustment and the inner buttons for the fine-tuning.

- | | |
|-------------------|--|
| Rotation Offset: | Correct the rotation of the sample disk until the balance pan lies exactly under the reference hole of the sample disk (without crucible). |
| Horizontal Offset | Correct the position of the balance until the balance pan lies exactly under the reference hole of the sample disk (without crucible). |

Vertical Offset Correct the height of the sample disk until the bottom of the crucible is positioned 3 mm above the balance pan (with crucible).

! NOTE
„Calibrate at start up“ must always be activated

7.9 Temperature calibration and adjustment

To perform a temperature calibration or adjustment you need a thermometer with a range up to 1000 °C and a tolerance of about +/- 5 °C. The temperature sensor diameter must be less than 3.2 mm, the length at least 16 cm.

Before you start insert the temperature sensor from the back of the prepASH trough the sensor inlet into the sample chamber, see also chapter 4, position 11. The insertion depth into chamber is 155 mm.

7.9.1 Temperature calibration

The temperature calibration is only to verify the temperature adjustment of the prepASH. In other words, to verify the prepASH is reaching the defined temperature for a measurement within a acceptable range of +/- 2% of the defined temperature.

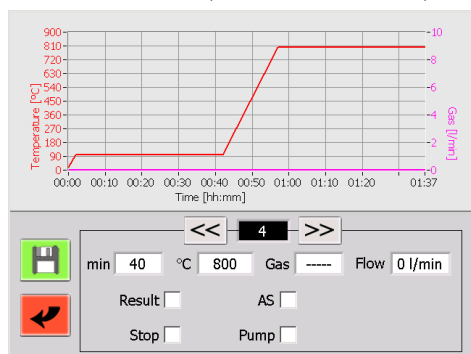
If the values are out of the this range you need to adjust the prepASH with a temperature adjustment.

The temperature calibration is performed similar to a normal drying and ashing procedure. Therefore you have to define a method with 2 temperatures where you like to verify the adjustment. The original factory adjustment and calibration has been made at 100 °C and 800 °C, so we recommend to use the same temperatures. But if you are working mainly with other temperatures, e.g. 105 °C and 550 °C you can modify the procedure accordingly. Make sure the prepASH has at least 30 minutes time to stabilize the temperature on each point.

1. Define the method with 2 temperatures T1 and T2

The factory calibration method for T1=100 °C and T2= 800 °C is:

- 2 min to 100 °C, 40 min at 100 °C, 15 min to 800 °C and 40 min at 800 °C



2. Start the calibration

After defining the method start the calibration like a normal measurement. You have to work without the turn table, crucibles and samples, therefore use the tare mode “Glow the crucibles” for the weighing in (refer to the operation manual for further information).

Make sure the external reference temperature sensor is inserted from the back of the prepASH.

3. Measure the real temperature at T1

According to your method verify the temperature of the external sensor versus the set temperature of your method as follows:

- Wait until about 5 minutes before the end of the stabilization phase (not less than 30 minutes) of the first temperature will finish.
- Read the temperature of the external thermometer as an average value over about 60 seconds and note this temperature as real temperature TR2.

4. Measure the real temperature at T2

According to your method verify the temperature of the external sensor versus the set temperature of you method as follows:

- Wait until about 5 minutes before the end of the stabilization phase (not less than 30minutes) of the second temperature will finish.
- Read the temperature of the external thermometer as an average value over about 60 seconds and note this temperature as real temperature TR2.

5. Verify the temperature T1 and T2 with the real temperature TR1 and TR2

The difference between T1 and TR1 as well as between T2 and TR2 should not exceed the specified limits of +/- 2% of the temperature T1 or T2 (e.g. +/-2 °C at 100 °C and +/-16 °C at 800 °C)!

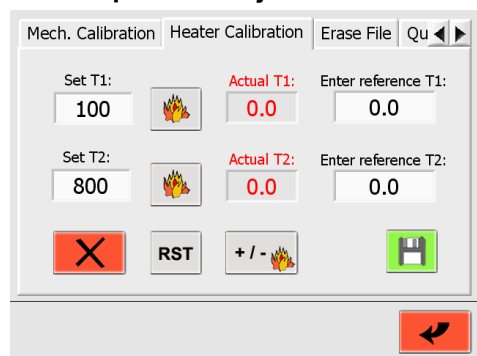
7.9.2 Temperature adjustment

The temperature adjustment has been performed during the manufacturing of the prepASH in the factory. Normally it is not necessary to adjust the prepASH out in the field!

⚠ CAUTION

We strongly recommend to make a temperature adjustment only if you have recognized big differences for the temperature settings during a temperature calibration. In this case perform an temperature adjustment to make sure the prepASH is reaching the defined temperature for a measurement within a acceptable range again.

The temperature adjustment screens looks as follows:



Performing the temperature adjustment in 2 steps as a 2 point adjustment

Step 1, at temperature “Set T1”

- Set the temperature “Set T1” for the lower calibration point e.g. drying temperature
- Press  to start heating
- Wait 30 minutes after the actual temperature “Actual T1” has stabilized
- Read the temperature of the external thermometer as an average value over about 60 seconds. Enter this value as reference at “Enter reference T1”.
- Press  to stop the heating

Step 2, at temperature “Set T2”

- Set the temperature “Set T” for the higher calibration point, e.g. ashing temperature
- Press  to start heating
- Wait 30 minutes after the actual temperature “Actual T2” has stabilized
- Read the temperature of the external thermometer as an average value over about 60 seconds. Enter this value as reference at “Enter reference T2”.

- Press  to stop the heating
- Save the new adjustment 

CAUTION

It is absolutely necessary to perform after the temperature adjustment a temperature calibration to verify the adjustment has been successful.
If the temperature calibration is not according the limits repeat the temperature adjustment.

Reset adjustment data

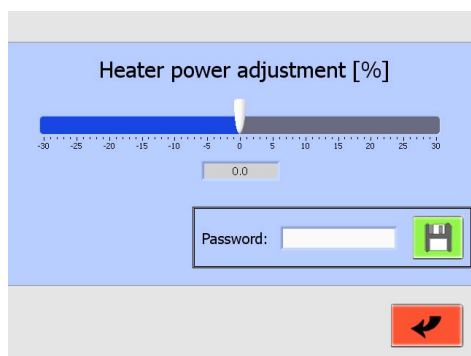
RST

Use this button to reset the temperature adjustment. Only use this function (before temperature adjustment) if the temperature values are totally out of range. You don't need this function for a normal temperature adjustment. After reset, do the temperature adjustment as illustrated above.

Adjust heater



Access for Service Engineer only. Password protected!



With the heater power adjustment, you have the possibility to increase/decrease the power for the temperatures up to 250 °C. This is helpful, if you have a big temperature overshoot at the beginning of a method step.

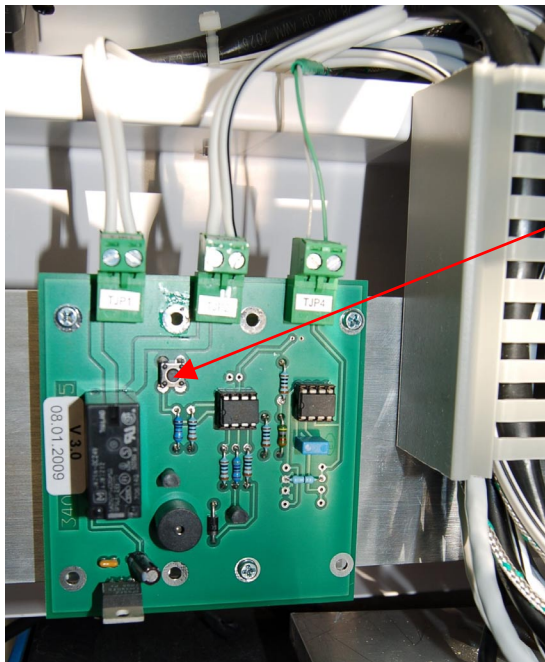
The heater power adjustment doesn't affect the temperature adjustment!

Only use this function if there is a difference of more than 2% between the effective and the target temperature.

Attention: You need a lot of time for the adjustment (you have to cool down the prepASH after every try).
E.g.: Start the adjustment with -5% if the effective temperature is 2°C over the target temperature at 100°C.

7.10 Calibration of the overheat protection temperature sensor

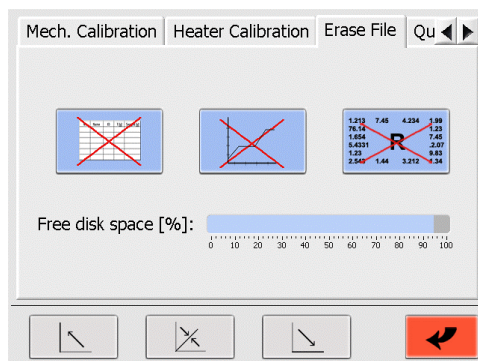
- open the two side walls and the front desk of prepASH to access to the print for calibration
- Heat up prepASH to 800 °C (in heating program or when calibrating at 800 °C)
- after the temperature has reached the temperature and has stabilized at 800 °C push the switch on the temperature sensor print for 5 s until the signal sounds



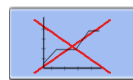
calibrate

- The sensor is calibrated automatically while the signal slowly beeping
- Hold the switch again for 10 s until the signal stops
- The temperature sensor is calibrated

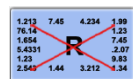
7.11 Erase file



Delete sample lists



Delete methods

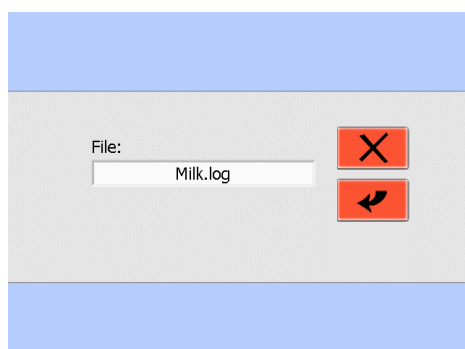


Delete results

Security query:

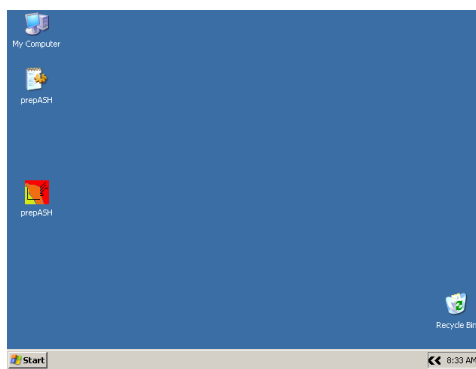
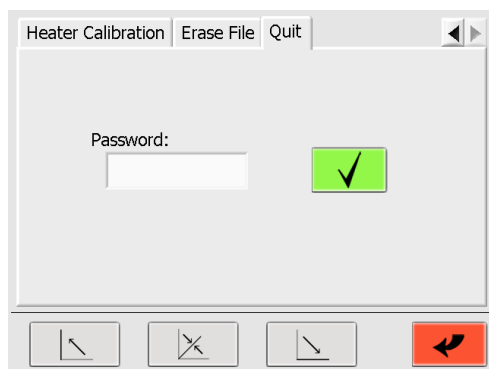


Press to confirm the file to delete



7.12 Quit

Only for service. Password protected!



8 Error messages

NOTE

If any Error appears, the first thing you have to try is to restart the prepASH!

8.1 Error 1: Interface board-Reset

The "Interface board" has made a self-reset.

All the data are deleted → restart the prepASH and start a new measurement.

If the **Error 1** appears again after the restart → Contact the Precisa Service

8.2 Error 2: Communication-error between Touch panel and Interface board

There is no communication between the „Touch panel“ and the „Interface board“ possible.

There could be different reasons for this problem:

1. The wire between the „Touch panel“ and the „Interface board“ is not properly connected.
→ Reconnect the wire and restart the prepASH.
2. The wire between the „Touch panel“ and the „Interface board“ is damaged.
→ The wire has to be replaced.
3. The Interface board was busy and couldn't receive the data from the prepASH.
→ Restart the prepASH (If the Error appears again → contact the Precisa Service.)

8.3 Error 3: Balance error

Restart the prepASH → Switch into the Service Mode → Go to the menu-tab to "Calibrate Balance" and see what is displayed on the screen. If the showed weight is about 0.000g, the balance is working properly and you can start a new run. If another information is shown on the display, the balance causes the error.

8.4 Error 4: Communication-error between Touch panel and Temperature-Module (7018)

There is no communication between the „Touch panel“ and the „7018-Module“ possible.

There could be different reasons for this problem:

1. The wire between the „Touch panel“ and the „Module“ is not properly connected.
→ Reconnect the wire and restart the prepASH.
2. The wire between the „Touch panel“ and the „Module“ is damaged.
→ The wire has to be replaced.
3. The Module did shutdown autoatically.
→ Restart the prepASH (If the Error appears again → contact the Precisa Service.)

8.5 Error 5: Communication-error between Touch panel and Flow-Module(7017)

There is no communication between the „Touch panel“ and the „7017-Module“ possible.

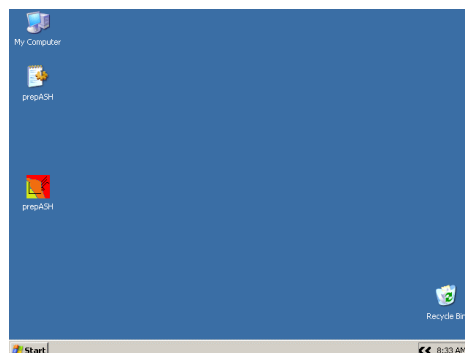
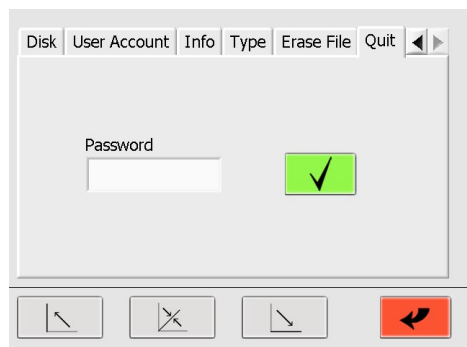
There could be different reasons for this problem:

- 1) The wire between the „Touch panel“ and the „Module“ is not properly connected.
→ Reconnect the wire and restart the prepASH.
- 2) The wire between the „Touch panel“ and the „Module“ is damaged.
→ The wire has to be replaced.
- 3) The Module did shutdown himself.
→ Restart the prepASH (If the Error appears again → contact the Precisa Service.)

9 PrepASH Software

9.1 PrepASH software update

1. Save the file "prepASH.exe" on an USB-Stick.
2. Quit the prepASH software: Change to the "Service Mode" → Go in the menu-tab to "Quit" → Insert "98180" in the "Password"-box → Press the ok-button.



3. Insert the USB-Stick in the prepASH.
4. Open the USB-Stick (→ double click on "My Computer").
5. Replace the file "prepASH.exe" (that is on the desktop) with the "prepASH.exe" that is on the USB-Stick.

Now, the software is updated. Either you restart the prepASH and the prepASH-software will start automatically, or you can start it by double-click the prepASH-Icon on the desktop.

9.2 Installing a printer on prepASH

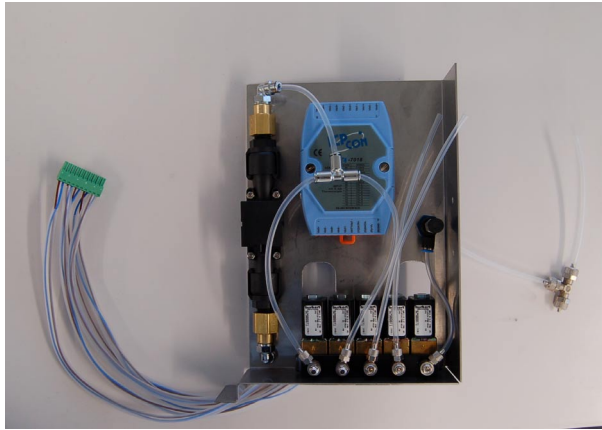
! NOTE

To install a printer on a prepASH, you need the specific driver of your printer for Windows XP. Either, you already have the driver on a CD or you have to download it from the homepage of the printer's producer.

1. Quit the prepASH software: Change to the "Service Mode" → Go in the menu-tab to "Quit" → Insert "98180" in the Password --> Press the ok-button.
2. Now, you are on the "Windows-Desktop" and you can install the printer on the same way like on a PC. The only difference is that you don't have a CD-drive. Because of this you have to copy the printer-driver on a USB-Stick.
3. Copy your printer-driver on a USB-Stick.
4. Insert the USB-Stick in the prepASH.
5. Open the USB-Stick (→ My Computer) and start the printer-setup.
6. After the installation is finished, either you restart the prepASH and the prepASH-software will start automatically, or you can start it by double-click the prepASH-Icon on the desktop.

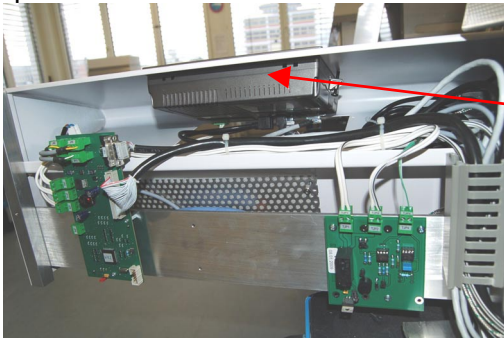
10 Process gas flow unit

See manual 340-8502 option Prozessgase delivered with the process gas flow unit



11 Terminal

1.  **Important:** disconnect the prepASH from the mains (Pull out mains plug)
2. open prepASH (side walls and front panel)
3. open the service cover on the bottom of the front panel



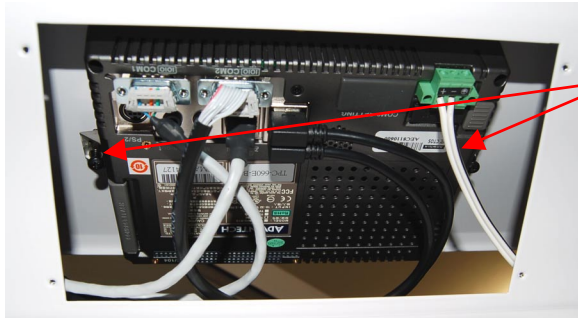
Terminal

11.1 Exchange flash card



Open the flash card cover of the right hand site of the terminal
Exchange the flash card (delivered with prepASH software)
All calibrations have to be redone

11.2 Exchange terminal



Remove all cable from the terminal
 Unscrew the two fixation screws around the terminal
 Exchange the terminal
 If the old flash card is o.k. enter the old flash card to the terminal (no calibration has to be done)
 If the flash card is exchanged too all calibrations have to be redone



12 Heating

12.1 Diagnosis

1. check the lower pneumatic switch (prepASH is only heating with the hood closed)
 - i. remove the left side wall
 - ii. the hood closed the lower pneumatic switch must shine
 - iii. check the position (48 mm hinge/lower border)
 - iv. exchange switch
2. check the heating
 - i. Resistance at power board
 unplug the plug 76/77/78
 measure resistance between 76/78 (16.5 Ω)

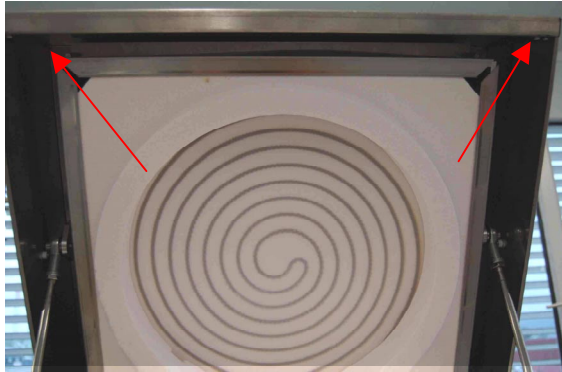
12.2 Remove upper cover

12.2.1 Tools

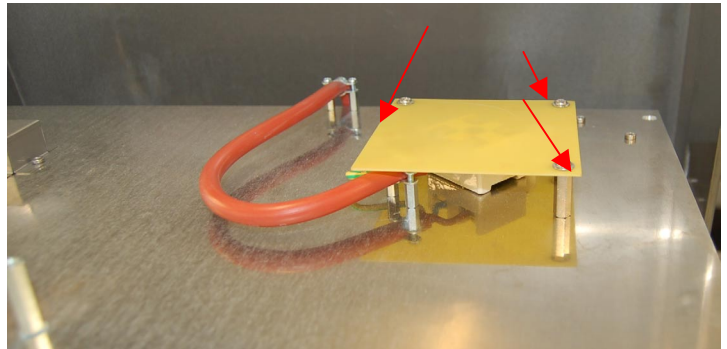
Pin type socket wrench (width across flats 7 mm)
 Phillips screwdriver

12.2.2 Remove upper cover

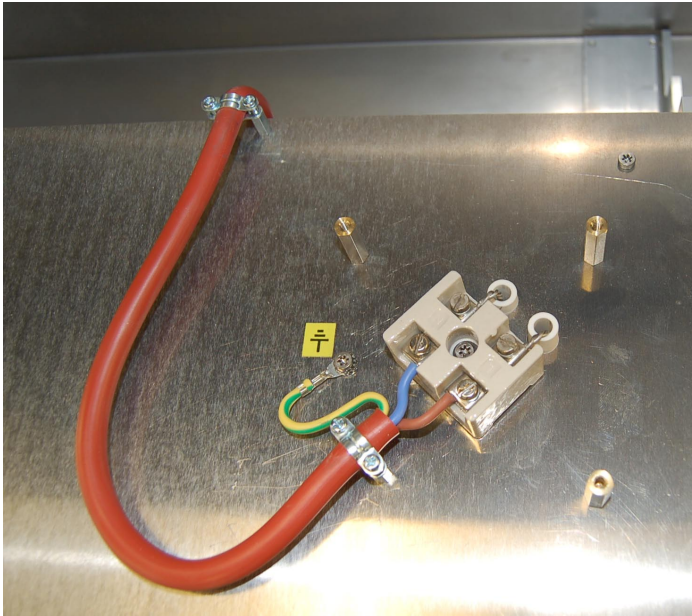
1. Open the hood from the touch screen software 
2. Unscrew the 2 hexagon bolts in the corners of the cover from below



3. Close the cover from the touchscreen 
4.  **Important:** disconnect the prepASH from the mains.
5. Pull the upper cover slightly forwards and tilt it back.



6. remove the protective shield
The clamp for the heating coil is accessible

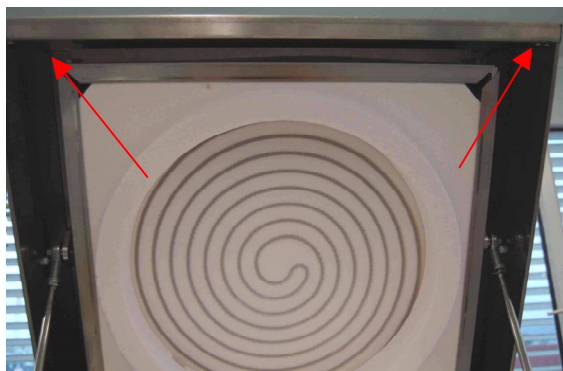


Exploded view diagram of a mechanical assembly. The diagram shows the following components and their quantities:

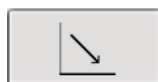
- 340-2004 1 St.
- PN1100-170 3 St.
- 340-4018 1 St.
- PN1048-022 1 St.
- PN1100-173 10 St.
- 340-4053 2 St.
- 340-4001 1 St.
- 340-4001 1 St.
- 340-4012 1 St.
- 340-4013 1 St.
- PN1500-027 2 St.
- PN3950-056 1 St.
- PN13650-005 6 St.
- PN1100-024 4 St.
- PN1048-015 6 St.
- 340-202 1 St.
- PN1500-075 2 St.
- PN3950-045 2 St.
- 340-5011 1 St.
- 340-5036 1 St.
- 340-5010 2 St.
- 340-5038 1 St.
- 340-3046 2 St.
- 340-2023 3 St.
- PN1100-217 2 St.
- 340-3028 2 St.
- PN1100-172 5 St.
- 340-5024 2 St.
- PN1100-169 16 St.
- 340-4002 2 St.
- 340-2950-CAD 1 St.
- 340-4019 1 St.

12.2.4.1 Remove upper cover

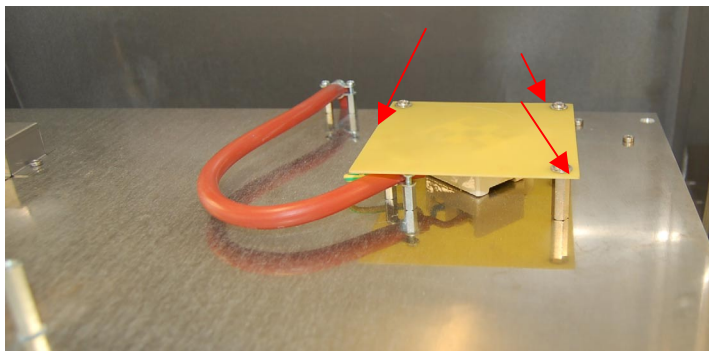
-



3. Close the cover from the touchscreen



4.  **Important:** disconnect the prepASH from the mains.
5. Pull the upper cover slightly forwards and tilt it back.

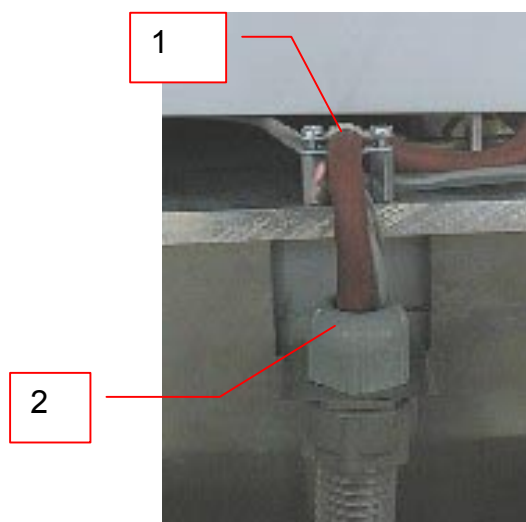
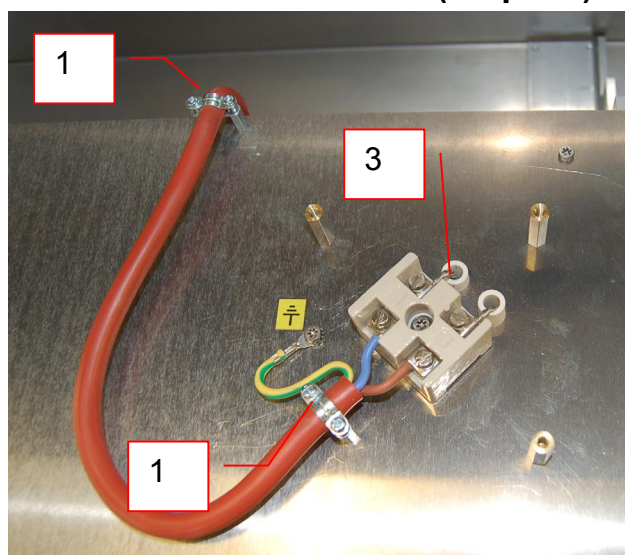


6. open the middle back
7. Unscrew the 8 screws from the back of the upper cover



8. lift the upper cover and push it to the front (caution cable isolation)
9. remove the upper cover completely
10. Remove the protective plate

12.2.5 Remove hood (hotplate)



1. remove the red cable from the hotplate (ground, 2 cables and 2 clamp)
2. Remove hose fitting with red connecting cable trough the clip
3. unscrew the ends of the heating coil and bend them to the top (pliers)
4. remove 2 screws from the top of the pneumatic cylinder (PN1100-217)
5. remove 2 screws from the hotplate hinges (PN 340-3046r)
6. lift the hotplate carefully (2 person needed/don't damage the isolation)
7. turn the hood upside down and lay it down with the quartz plate on top

12.2.6 Uncover isolation/heating coil

8. remove the 4 faceplates (340-2023/340-2024)
9. remove the heating isolation (340-4013) and the quartz disk (340-4019)
10. remove the heating coil (don't damage the isolation by pulling out the lose ends!)

12.2.7 Install isolation/heating coil

11. Insert the heating coil (340-22050) into the spiral of the isolation (the heating coil is delivered stretched/buckled, outer spiral = longer part)
12. insert the lose ends of the heating coil carefully into the upper isolation
13. install quartz disk (340-4019) and heating isolation (340-4013)
14. install the 4 faceplates (340-2023/340-2024)

12.2.8 Assemble hood (hotplate)

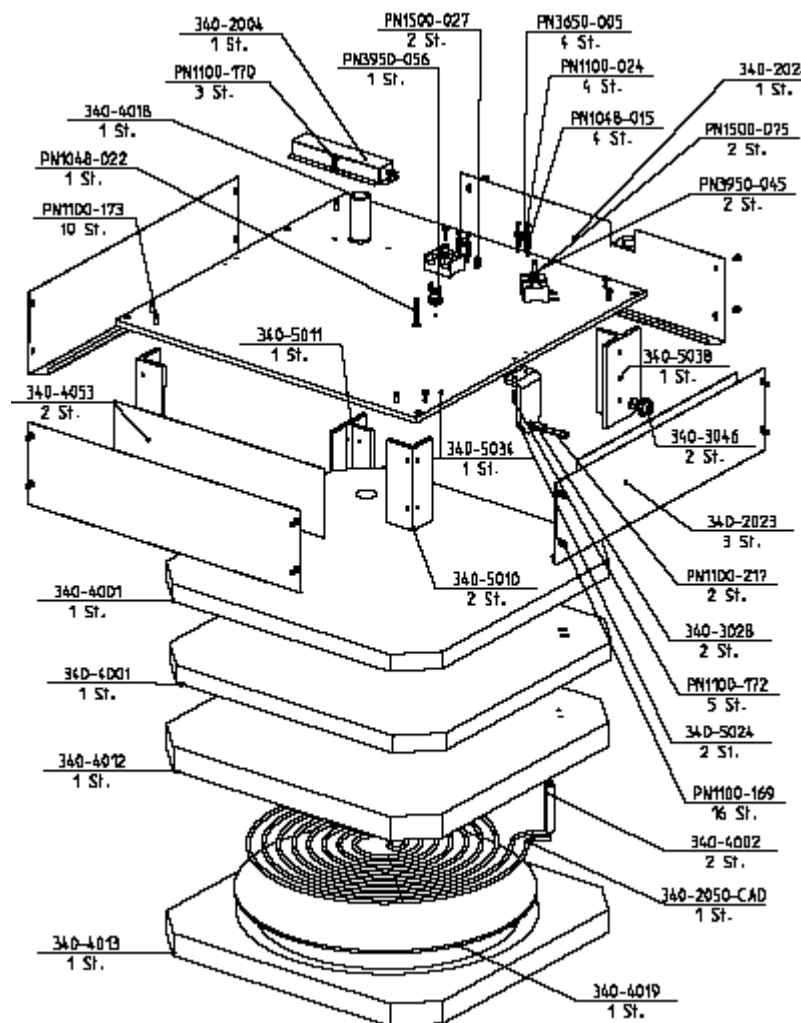
15. turn the hood and fix it to the hotplate hinges (PN 340-3046)
16. fix the pneumatic cylinder win (PN1100-217)
17. bend the lose ends of the heating coil and screw them on the clamp
18. fix hose fitting with red connecting cable trough the clip
19. screw the red connecting cable on the clamp on the hotplate (ground, 2 cables and 2 clamp)

12.2.9 Assemble upper cover

20. put the upper cover on the hotplate (displaced slightly to the front, **caution: cable isolation**)
21. put the upper cover to the correct position
22. Fix the 8 screws from the back
23.  plug in the mains cable and turn on the instrument
24. Open (by software) and fix the hood
25.  turn off prepASH and disconnect from the mains
26. fix the upper cover with 2 screws in the corners from below
27. put the cable ties
28. close the back board
29. remove the balance protection plug and slide in the weighing pan
30. remove the hood locking device
31.  plug in the mains cable and turn on the instrument
32. close the side walls

13 Exchange isolations/quartz disk

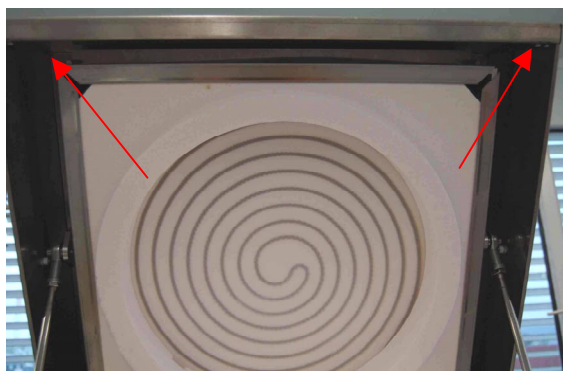
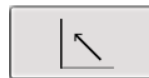
13.1 Upper isolation (drawing 340-8007)



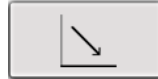
13.1.1 Remove upper cover completely

13.1.1.1 Remove upper cover

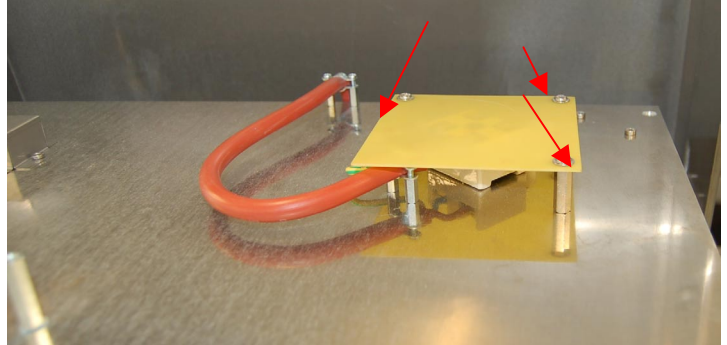
1. Open the hood from the touchscreen software 
2. Unscrew the 2 hexagon bolts in the corners of the cover from below



3. Close the cover from the touchscreen



4.  **Important:** disconnect the prepASH from the mains.
5. Pull the upper cover slightly forwards and tilt it back.

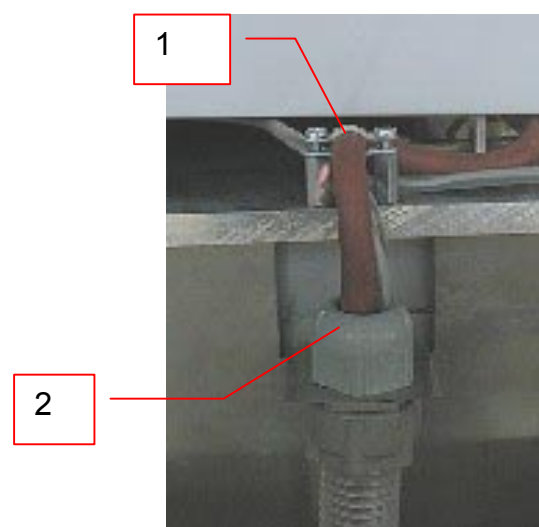
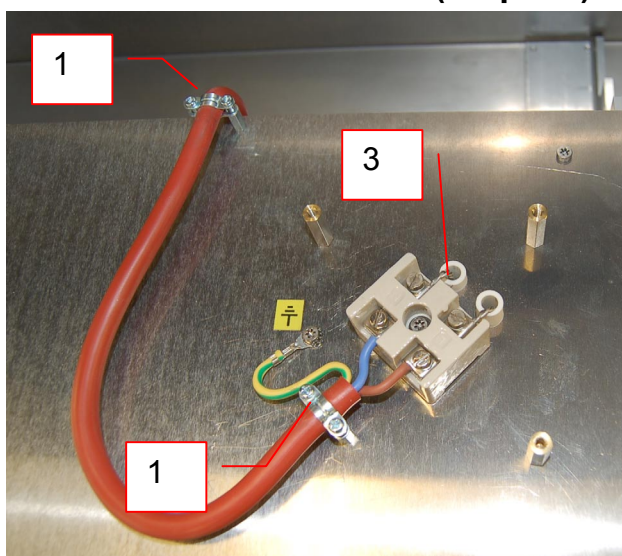


6. open the middle back
7. Unscrew the 8 screws from the back of the upper cover



8. lift the upper cover and push it to the front (caution cable isolation)
9. remove the upper cover completely
10. Remove the protective plate

13.1.2 Remove hood (hotplate)



33. remove the red cable from the hotplate (ground, 2 cables and 2 clamp)
34. Remove hose fitting with red connecting cable trough the clip

35. unscrew the ends of the heating coil and bend them to the top (pliers)
36. remove 2 screws from the top of the pneumatic cylinder (PN1100-217)
37. remove 2 screws from the hotplate hinges (PN 340-3046r
38. lift the hotplate carefully (2 person needed/don't damage the isolation)
39. turn the hood upside down and lay it down with the quartz plate on top

13.1.3 Isolation

1. remove the 4 faceplates (340-2023/340-2024)
2. remove the heating isolation (340-4013) (and the quartz disk (340-4019))

13.1.4 Assemble the isolation/quartz disk

1. install quartz disk (340-4019) and heating isolation (340-4013)
2. install the 4 faceplates (340-2023/340-2024)

13.1.5 Assemble hood (hotplate)

3. turn the hood and fix it to the hotplate hinges (PN 340-3046)
4. fix the pneumatic cylinder win (PN1100-217)
5. fix hose fitting with red connecting cable trough the clip
6. screw the red connecting cable on the clamp on the hotplate (ground, 2 cables and 2 clamp

13.1.6 Assemble upper cover

7. put the upper cover on the hotplate (displaced slightly to the front, **caution: cable isolation**)
8. put the upper cover to the correct position
9. Fix the 8 screws from the back
10.  plug in the mains cable and turn on the instrument
11. Open (by software) and fix the hood
12.  turn off prepASH and disconnect from the mains
13. fix the upper cover with 2 screws in the corners from below
14. put the cable ties
15. close the back board
16. remove the balance protection plug and slide in the weighing pan
17. remove the hood locking device
18.  plug in the mains cable and turn on the instrument
19. close the side walls

13.2 Exchange lower isolation

The cover has to be removed to change the lower isolation.

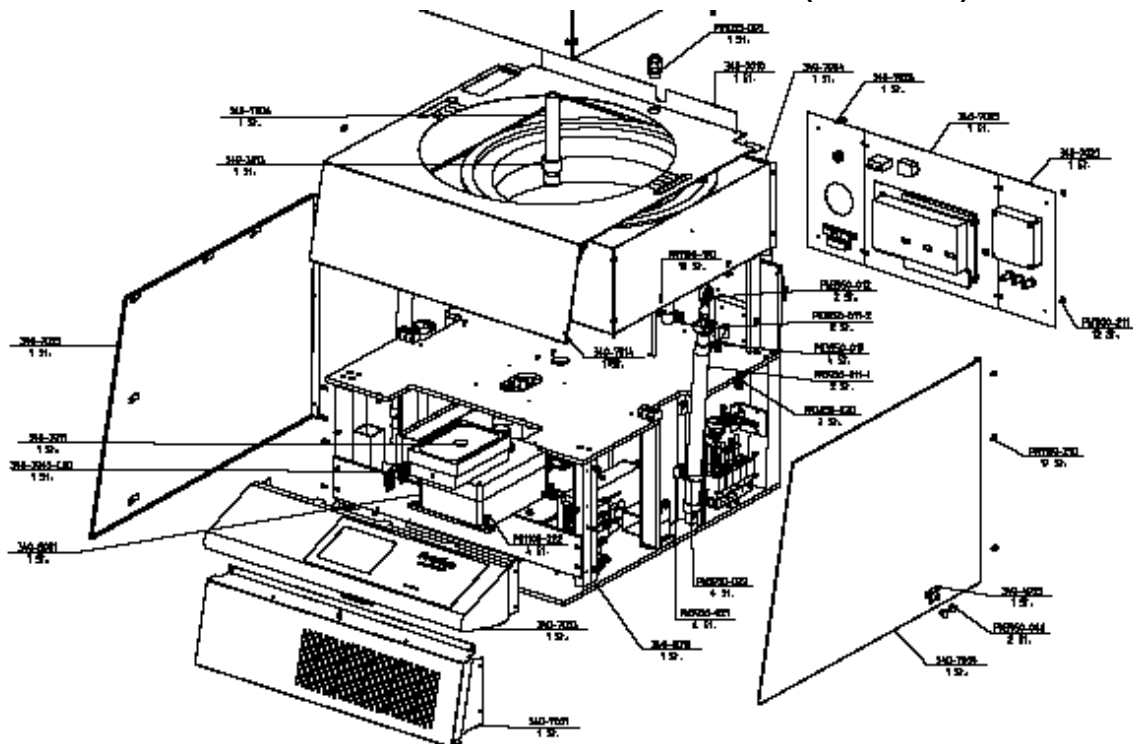
13.2.1 remove upper cover

1. open and fix the hood with the hood locking device
2. remove sample plate and weighing pan and fix the red balance protection plug.
3. **Important:** disconnect the prepASH from the mains (Pull out mains plug)
4. open prepASH (side walls and front panel)
5. open the middle back
6. unscrew the 4 screws in the corners of the cover from below
7. remove the hood locking device and close the hood manually
8. lift the upper cover and push it to the front (caution cable isolation)
9. remove the upper cover completely

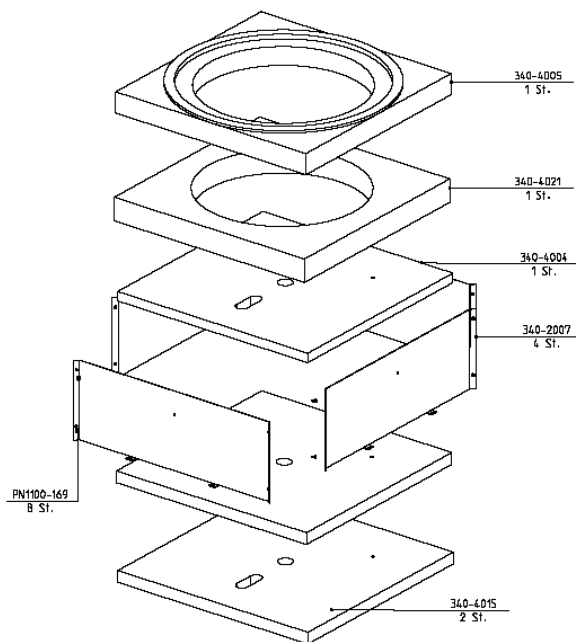
13.2.2 Remove hood (hotplate)

10. remove the red cable from the hotplate (ground, 2 cables and 2 clamp)
11. Remove hose fitting with red connecting cable trough the clip
12. remove 2 screws from the top of the pneumatic cylinder (PN1100-217)
13. remove 2 screws from the hotplate hinges (PN 340-3046)
14. lift the hotplate carefully (2 person needed/don't damage the isolation)
15. turn the hood upside down and lay it down with the quartz plate on top

13.2.3 Uncover and remove the lower isolations (340-6400)



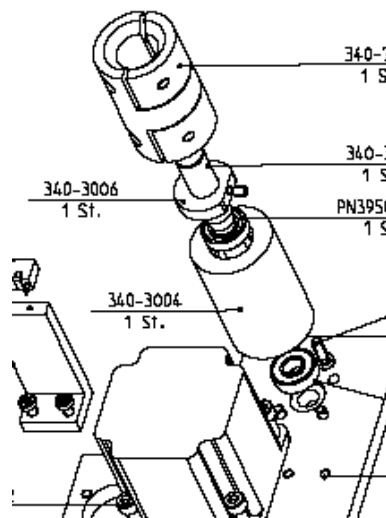
16. remove the two thermocouples
17. remove golf-ball from pneumatic cylinder (PN3950-012)
18. remove the decorative metal (340-7014) by opening the 4 screws
19. **remove the lance** (fragile, handle with care -> 15 "Exchange the lance" p. 37)
20. remove front sheet metal



21. Lateral metals

- if only the lateral isolations have to be replaced, it is sufficient to remove the metals from the base plate
- if the isolation at the bottom has to be replaced, the metals have to be removed completely.

remove the rotation axis (open the 2 screws at the top of the axis coupling and remove the axis from the top)



22. remove isolations (bottom isolation: caution to the stack and the temperature sensor)

13.2.4 Assemble the isolations

- insert the isolations (bottom isolation: caution to the stack and the temperature sensor)
- fix the sheet metal (PN1100-169)
- if necessary install the axis of rotation (carefully align the axis when tightening the screws)
- install the lance
- put up the decorative metal and fix it with the 4 screws.
- screw on the golf-ball to the pneumatic cylinder

13.2.5 Assemble the hood (hotplate)

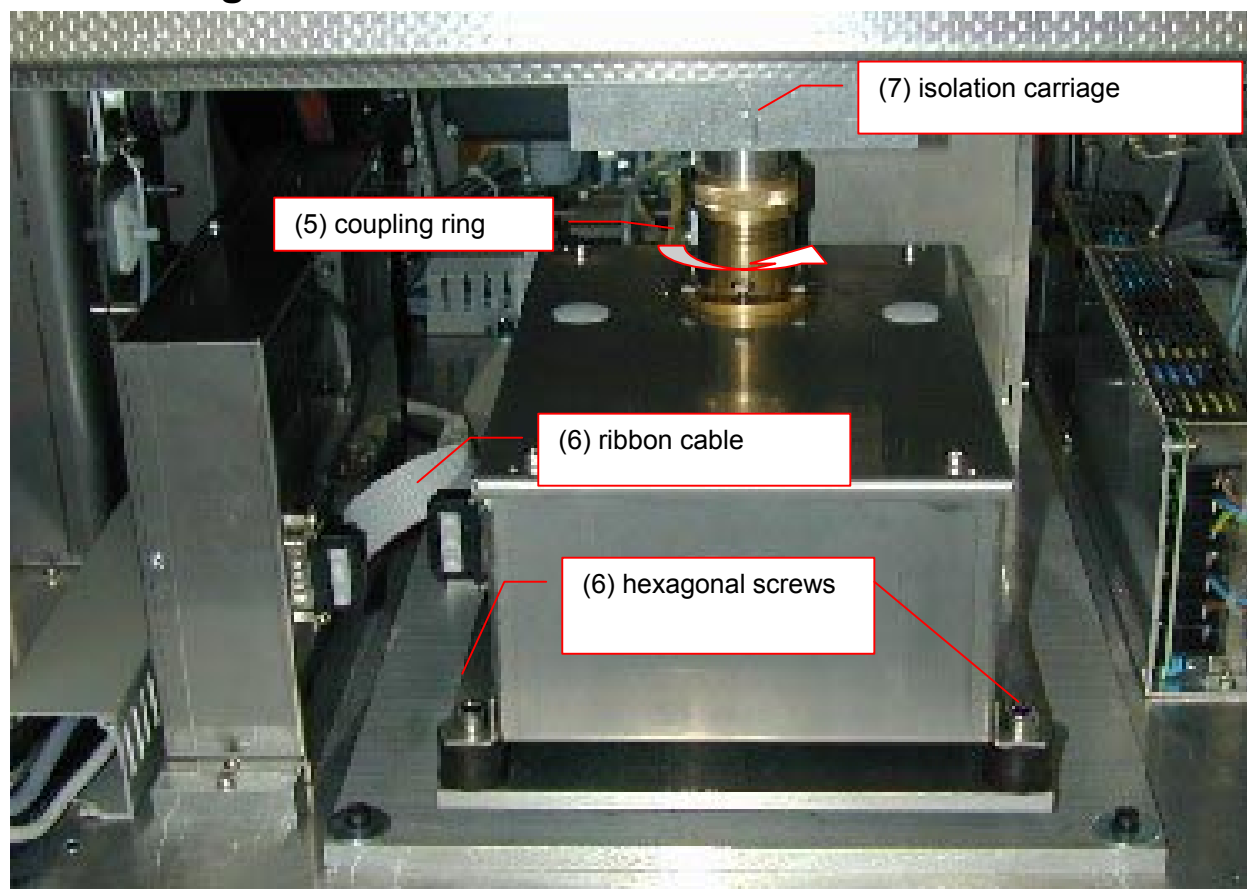
- turn the hood and fix it to the hotplate hinges (PN 340-3046)
- screw on the pneumatic cylinders (PN1100-217)

31. fix hose fitting with red connecting cable trough the clip
32. screw the red connecting cable on the clamp on the hotplate (ground, 2 cables and 2 clamp)

13.2.6 Assemble upper cover

33. put the upper cover on the hotplate (displaced slightly to the front, **caution: cable isolation**)
34. put the upper cover to the correct position
35.  plug in the mains cable and turn on the instrument
36. Open (by software) and fix the hood
37.  turn off prepASH and disconnect from the mains
38. fix the upper cover with 4 screws in the corners from below
39. put the cable ties
40. close the back board
41. remove the balance protection plug and slide in the weighing pan
42. remove the hood locking device
43.  plug in the mains cable and turn on the instrument
44. close the side walls
45. mechanical calibration (->7.8 Mechanical calibration" p.15)
in case the rotation axis has been removed, the offsets have to be redetermined

14 Exchange the stack



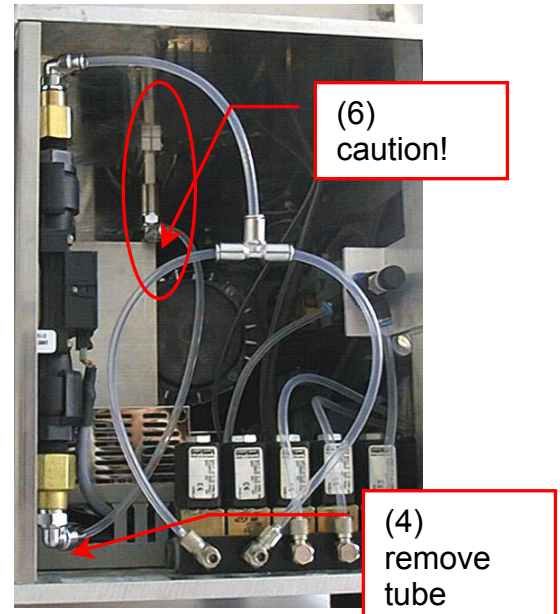
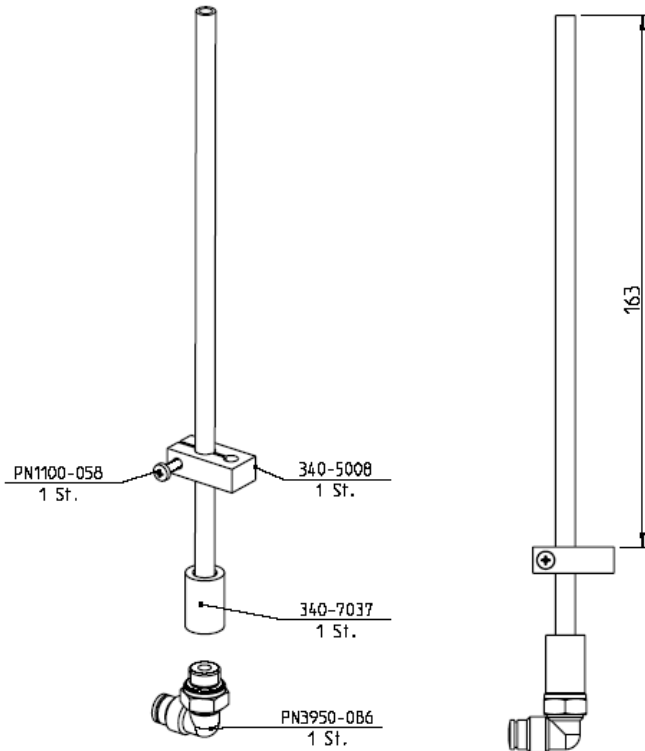
14.1.1 Disassembling

4. open and fix the hood with the hood locking device
5.  **Important:** disconnect the prepASH from the mains (Pull out mains plug)
6. open prepASH (side walls and front panel)
7. remove sample plate and weighing pan and fix the red balance protection plug
8. loosen coupling ring of the stack
9. disconnect the ribbon cable from the balance and remove the 4 hexagonal screws of the balance mounting part
10. push the isolation carriage to the back (lift the stack)
11. lift the balance slightly and remove it to the front (caution to the stack)
12. remove the stack to the bottom

14.1.2 Installation

13. insert stack (balance ready to hand)
14. install the balance (lift stack), tighten the 4 screws)
15. tighten the coupling ring
16. plug in the ribbon cable
17. slide in the weighing pan (remove the red protection plug)
18. if necessary align the stack with set screws.

15 Exchange the lance



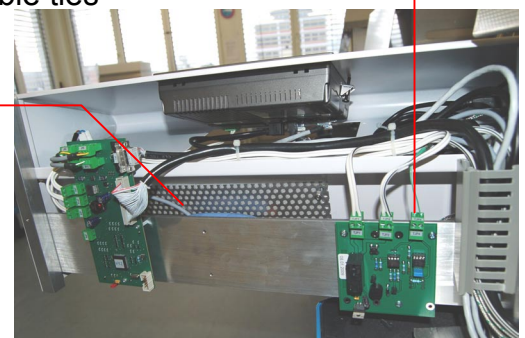
1.  **Important:** disconnect the prepASH from the mains (Pull out mains plug)
2. open the middle back
3. open the right side wall
4. remove the tube from the **lower** connection
5. unscrew the lance from the hotplate
6. pull the lance carefully to the bottom (turn it not to crash with the drive unit)
7. unscrew the lance fastener (340-5008) and the connection (PN 3950-086)
8. fix both to the new lance (340-7038)
9. insert the lance carefully into the hotplate and fix it.
10. connect the tube.

16 Replace the thermometer

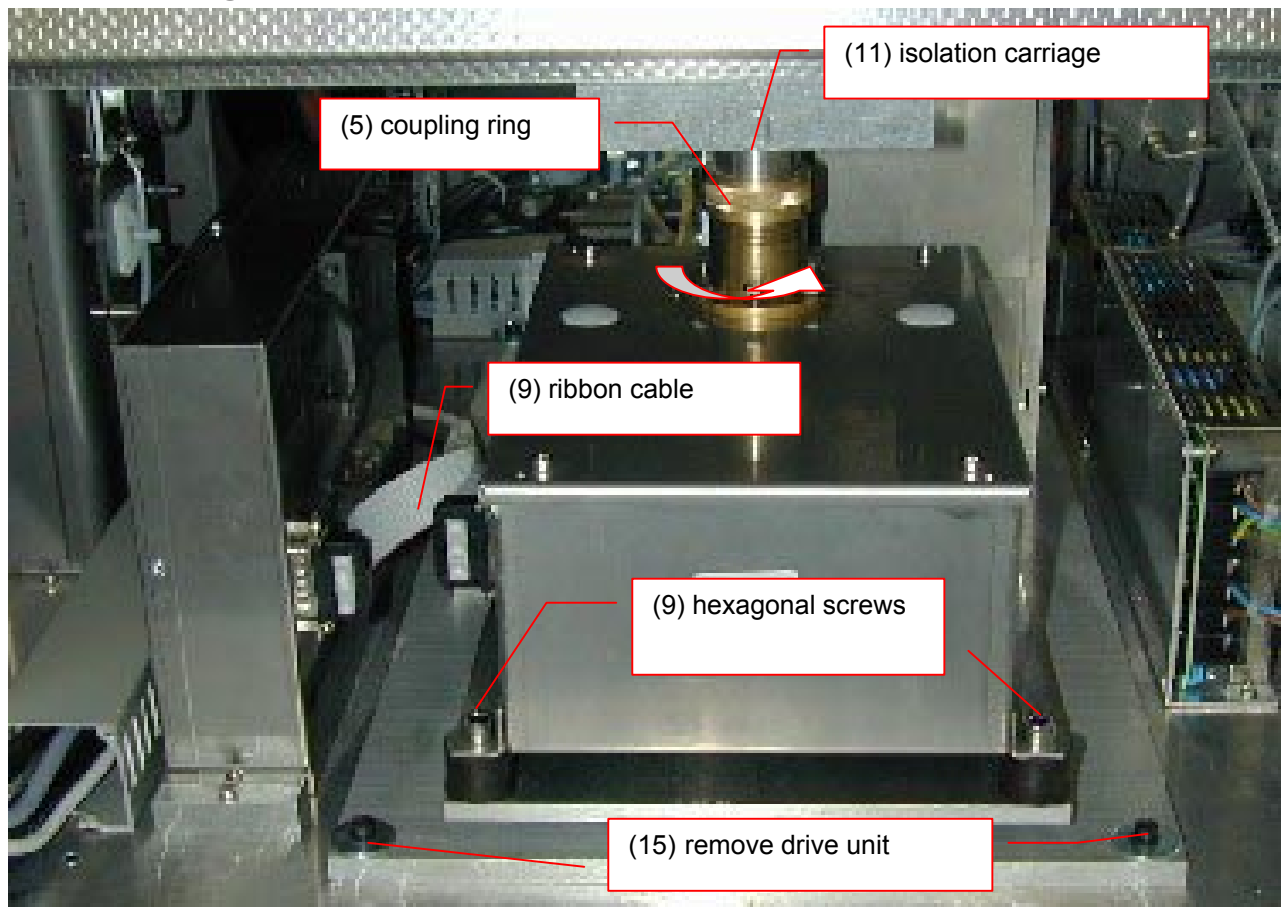
1.  **Important:** disconnect the prepASH from the mains
2. open prepASH (side walls and front panel)
3. unplug the thermometer open cable duct
cut the cable tie required and disentangle the cables
4. remove the thermometer by turning
5. insert new thermometer
6. lay the cable into the cable duct and fix it with cable ties
7. plug in
8. calibrate

Thermometer for
overheating

Thermometer for
temperature



17 Exchange the drive unit



17.1.1 Disassembling

1. open and fix the hood with the hood locking device
2.  **Important:** disconnect the prepASH from the mains (Pull out mains plug)
3. open prepASH (side walls, front panel and middle back)
4. remove sample plate and weighing pan and fix the red balance protection plug
5. remove carefully the lance
6. unplug on the power board: 3 stepping motors (M1, M2, M3: 45-56) and position switch(1-6)
7. open cable duct and disentangle the cables
8. disconnect the ribbon cable from the balance and remove the 4 slotted head screws of the balance mounting part
9. push the isolation carriage to the back (lift the stack)
10. lift the balance slightly and remove it to the front (caution to the stack)
11. remove the stack to the bottom
12. remove the isolation carriage to the front
13. remove the axis of rotation (open the 2 screws at the top of the axis coupling and remove the axis from the top)
14. remove the drive unit to the front (4 screws)

17.1.2 Installation

15.  **Important:** disconnect the prepASH from the mains (Pull out mains plug)
16. insert the drive unit from the front, tighten the 4 screws only slightly (-> later positioning)
17. insert axis of rotation and tighten the 2 upper screws on the axis coupling)
18. align the drive unit, fine positioning with set screws (all set screws must be in contact to the plate!), tighten the 4 slotted head screws
19. insert isolation carriage (orientation: the "V" must be visible from the front)
20. Insert stack (balance ready to hand)
21. Install the balance (lift stack), tighten the 4 screws)
22. tighten the coupling ring
23. plug in the ribbon cable
24. slide in the weighing pan (remove the red protection plug)
25. if necessary align the stack with set screws.
26. install lance
27. plug in on the power board: 3 stepping motors (M1, M2, M3: 45-56) and position switch(1-6), close the cable duct (Caution M2 must be carried over the duct)
28. close the middle back
29. close front panel
30. close side walls
31. mechanical calibration, the offsets have to be redetermined (->7.8 Mechanical calibration" p.15)

18 Adjust pneumatic

1.  **Important:** disconnect the prepASH from the mains
2. Check air pressure (6 bar)
3. open right side wall
4. open/close the hood manually
5. adjust throttle valve (on the top (1))
(this is only working when disconnected from mains)
6.  plug in the mains cable and turn on the instrument
7. open hood (Software) and adjust throttle valve (on the front (2))
(opening time ca. 12 s)
8. close hood (Software) and adjust throttle valve (on the back(3))
(closing time ca. 12 s)

